Fast Track Troubleshooting

Model: SMH2117*/XAA**

IMPORTANT SAFETY NOTICE – "For Technicians Only" This service data sheet is intended for use by persons having electrical, electronic, and mechanical experience and knowledge at a level generally considered acceptable in the appliance repair trade. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible, nor assume any liability for injury or damage of any kind arising from the use of this data sheet.

Publication # rsSMH2117 Revision Date 1/26/2012

SUPPORT INFORMATION
Training — Plus One **http://my.plus1solutions.net/clientPortals/samsung/**
Help — GSPN http://gspn3.samsungcsportal.com
Samsung Product Support TV **http://support-us.samsung.com/spstv/howto.jsp**
Customer information videos and chat programs. Programs for Fridges, Laundry, Ranges & D/W

Error Code	Cause and countermeasure
-SE-	Key short error (10 sec.). Replace assy. control panel or smart board.
E-11	Sensor open error. Check unplugged sensor, wiring or smart board. If necessary, replace sensor. If error code appears when starting sensor function, replace smart board.
E-12	Sensor short error. Check shorted sensor or smart board. If necessary, replace sensor. If error code appears when starting sensor function, replace smart board.
E-13	Sensor T1 max time error. Check sensor. If necessary, replace sensor. If error code appears when starting sensor function, replace smart board.

SENSOR TEST (QUICK TEST)
1. With 2 fingers touch and hold the following pads at the same time:
Auto Defrost and Popcorn
2. Observe diagnostic number in display (Numbers approximate).
- 15-185 (Normal-verify with "detection test")
- 213 or Higher (Sensor failed to open, sensor unplugged, wiring or smart board).
- Less than 6 (shorted sensor or smart board).

NOTE: Only heater terminals (Black and Red leads) can be checked with an ohmmeter (30Ω).
CAUTION: DO NOT ATTEMPT TO CHECK SENSOR TERMINALS (White and Orange leads).

TO TEST BLOWER WINDINGS: **1.** Disconnect power and remove grill. **2.** Open control panel and discharge capacitor. **3.** Continuity test across the two wires of the run capacitor should be approximately 120 ohms of resistance. This test allows you to read across all three windings at the same time. Thermal protector reads 0 ohms from white to orange.

Oven Thermal Cutout

The oven thermal cutout (Cavity TCO) is located on the top side of the oven cavity beside the exhaust duct with a temperature rating of 248°F (120°C) and is **NOT** resettable.

Hood Thermal Cutout

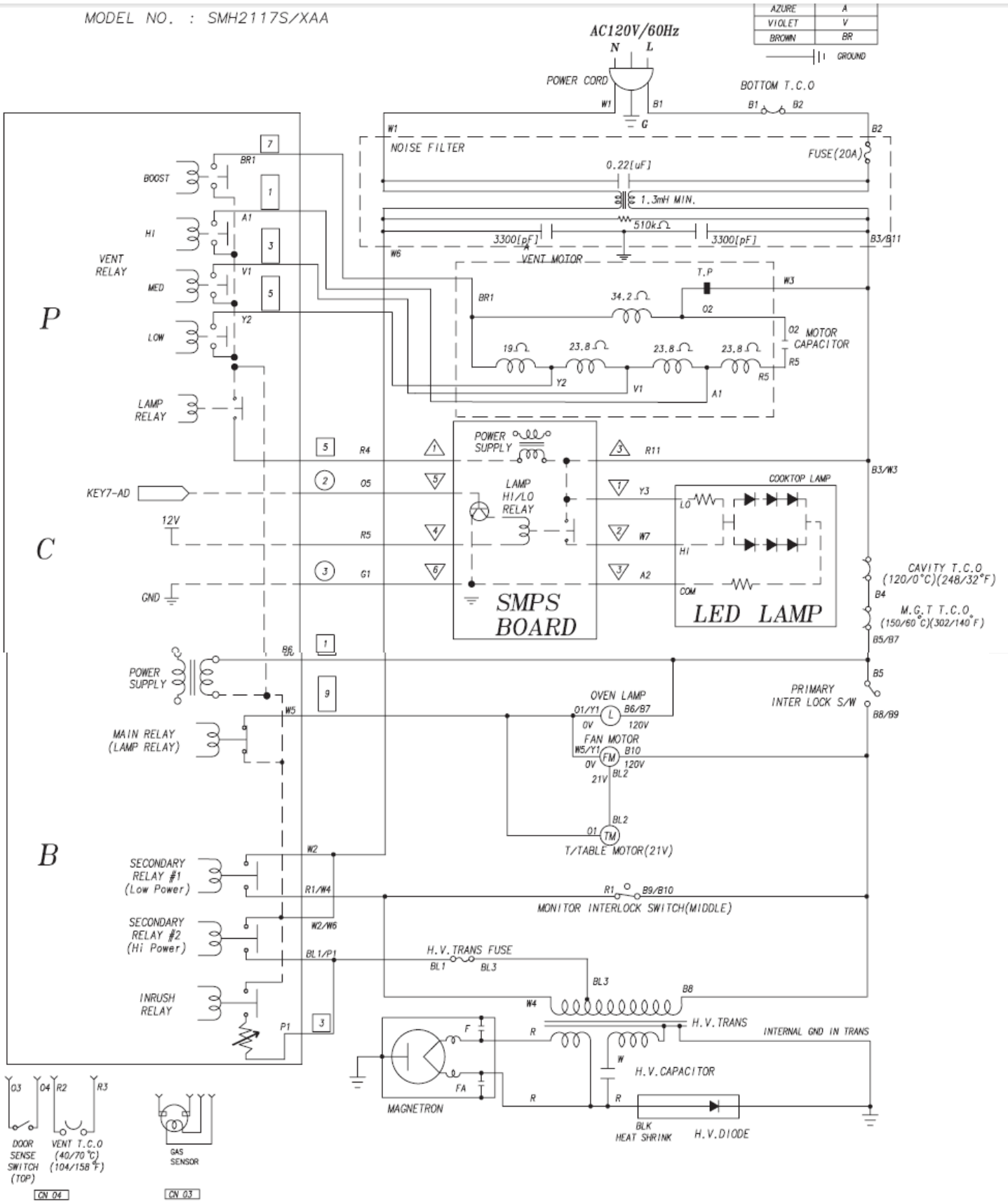
This cutout will protect the touch control from excessive heat by turning the vent fan on at low speed. If the surface units of the range are used for long periods of time heat will build up and could damage the microwave control. In order to prevent this, a thermal cutout is installed on the duct behind the control. This cutout will close (158°F/70°C - vent fan energized) and open (104°F/40°C - vent fan de-energized) depending on temperature.

Magnetron Thermal Cutout

The magnetron thermal cutout is located above the leads to the magnetrons. It is designed to prevent damage to the magnetron if an overheated condition develops in the tube due to cooling fan failure, obstructed air ducts, dirty or blocked air intake. Under normal operation, the magnetron thermal cutout remains closed. However, when abnormally high temperatures are reached within the magnetron, the magnetron thermal cutout will open at 302°F (150°C) causing the oven to shut down. After the temperature drops to 140°F (60°C) it will reset and cooking will be able to resume.

Bottom Thermal Cutout

During a fire on the stove the heat could be intense enough to close the Hood Thermal Cutout and force the fan to run. While at moderate high temperature we do want it to run, however during a fire it is advantageous to NOT have the vent fan running. So if a fire were to start on the stove top the Bottom Thermal Cutout would open at 248°F (120°C) and remove all power to the microwave oven. This cutout is **NOT** resettable.

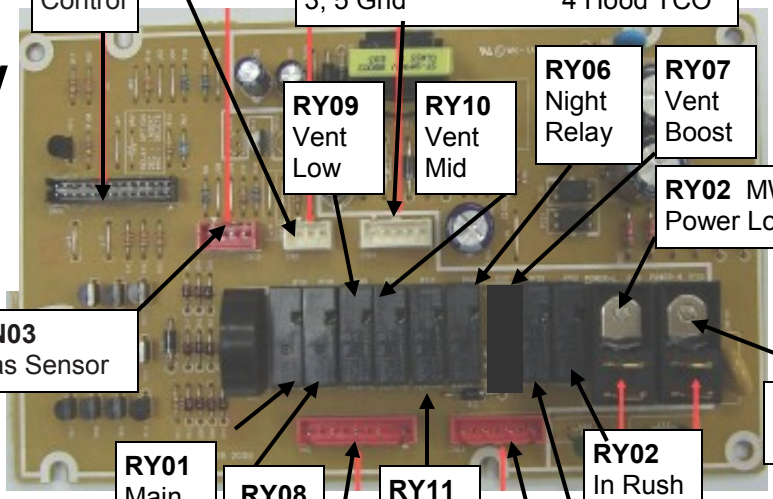

MODEL NO. : SMH2117S/XAA
AC120V/60Hz
N
L
POWER CORD
W1
B1
G
BOTTOM T.C.O
B1
B2
AZURE
A
VIOLET
V
BROWN
BR
GROUND
NOISE FILTER
0.22[uF]
1.3mH MIN.
510k
3300[pF]
3300[pF]
FUSE(20A)
B2
B3/B11
W6
VENT MOTOR
T.P
W3
BR1
34.2
02
02 MOTOR CAPACITOR
19
23.8
23.8
23.8
R5
Y2
V1
A1
BOOST
HI
MED
LOW
VENT RELAY
LAMP RELAY
P
C
B
POWER SUPPLY
LAMP HI/LO RELAY
SMPS BOARD
R4
O5
R5
G1
R11
Y3
W7
A2
COOKTOP LAMP
LO
HI
COM
LED LAMP
B3/W3
CAVITY T.C.O (120/0°C)(248/32°F)
B4
M.G.T T.C.O (150/60°C)(302/140°F)
B5/B7
B5
PRIMARY INTER LOCK S/W
B8/B9
KEY7-AD
12V
GND
B6
W5
MAIN RELAY (LAMP RELAY)
OVEN LAMP
O1/Y1
B6/B7
0V
120V
FAN MOTOR
W5/Y1
B10
0V
120V
21V
BL2
O1
T/TABLE MOTOR(21V)
SECONDARY RELAY #1 (Low Power)
W2
R1/W4
R1
B9/B10
MONITOR INTERLOCK SWITCH(MIDDLE)
SECONDARY RELAY #2 (Hi Power)
W2/W6
BL1/P1
H.V.TRANS FUSE
BL1
BL3
BL3
B8
W4
INRUSH RELAY
P1
H.V.TRANS
INTERNAL GND IN TRANS
F
FA
R
W
H.V.CAPACITOR
MAGNETRON
BLK HEAT SHRINK
H.V.DIODE
O3
O4
R2
R3
DOOR SENSE SWITCH (TOP)
VENT T.C.O (40/70°C) (104/158°F)
CN 04
GAS SENSOR
CN 03

Power

CN05 Main Control

CN06 CT LED

CN04 Door Connector
1 Door sw 12vdc
2 Door sw
3, 5 Gnd
4 Hood TCO



RY09 Vent Low

RY10 Vent Mid

RY06 Night Relay

RY07 Vent Boost

RY02 MW Power Low

CN03 Gas Sensor

RY01 Main Relay

RY08 TT

RY11 Vent High

RY02 In Rush

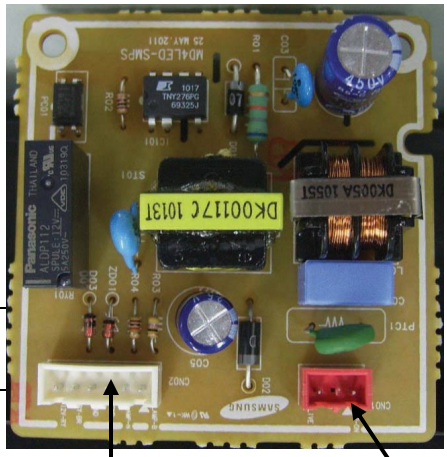
RY03 MW Power

RY05 Bright Relay

CN02 Pwr & Relay
1 Vent High
3 Vent Mid
5 Vent Low
9 Main-lamp, fan, TT

CN01 Power
1 Line 1
3 In rush
5 Cook top lamp
7 Boost

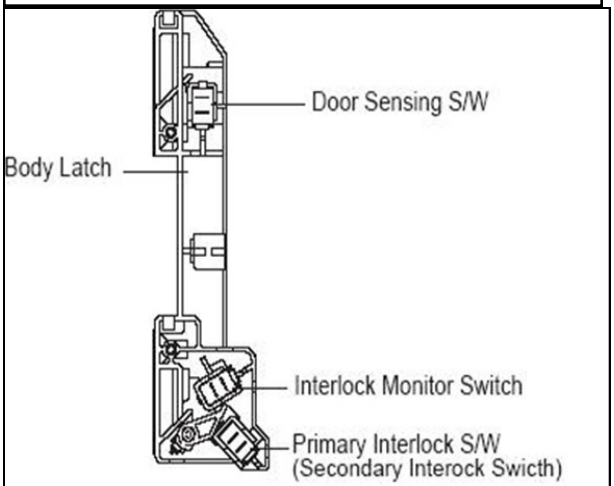
Cook top LED drive



CN02 Pwr & Relay
1 LED low
2 LED high
3, 4 Ground
5 High control
6 12 VDC

CN01 Power
1 Lamp on N
3 Live 1

Door Interlock Ass'y



	Door Open	Door Closed
Primary Interlock switch	∞	0
Monitor switch(COM-NC)	0	∞
Monitor switch(COM-NO)	∞	0
Door Sensing S/W (Secondary Interlock S/W)	∞	0

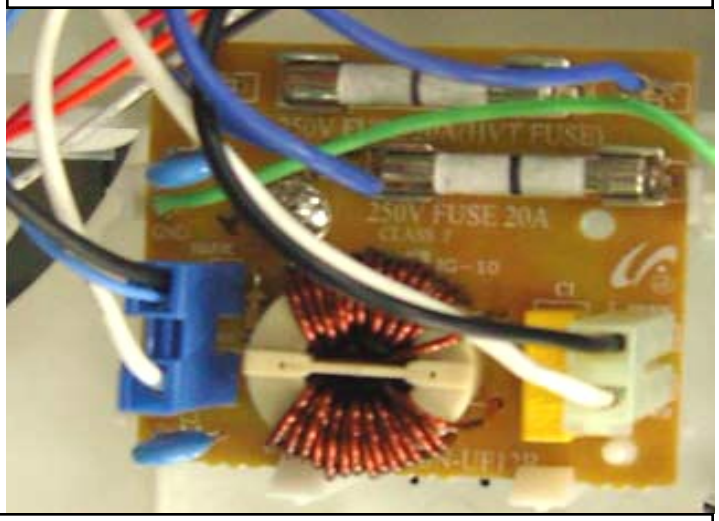
The fuses are located on the noise filter.

1. Disconnect power and remove grille and Assembly Control Box.

2. Replace the fuse.

3. When 20A fuse blows out by the operation of interlock monitor switch failure, replace the primary interlock switch, secondary interlock switch, door sensing switch, interlock monitor switch and power relay.

4. When the above four switches operate properly, check if any other part such as the control circuit board, blower motor or high voltage transformer is defective.



Microwave cover assembly

The front of the top cover has flanges that must fit inside the front frame and vent, and the bottom goes above the bottom cover. Start with the left side and hold in place with one screw once engaged. Leave the display loose so you can see that the right side is engaged properly. Then mount display and the vent, ensuring the vent engages the flange.

Microwave Cooking Wattage Test

Fill a 1000ml plastic room temperature container with cool tap water, temperature of the water should be 55-65 degrees

Stir water with a thermometer and record the water temperature, remove thermometer.

Place the container in the center of the lowest shelf or center of the bottom of the microwave.

For units less than 1550 watts, operate the oven on high for exactly 63 seconds.

Using the thermometer, stir the water to check the temperature of the water.

Subtract the starting temperature from the final temperature; this will be the temperature rise.

NOTE: Check line voltage under load, lower line voltage will lower the power output.

Temp Rise	Output	Temp Rise	Out-
5	194	23	891
6	232	24	930
7	271	25	969
8	310	26	1007
9	349	27	1046
10	387	28	1085
11	426	29	1124
12	464	30	1162
13	504	31	1201
14	542	32	1240
15	581	33	1279
16	620	34	1317
17	659	35	1356
18	697	36	1395
19	736	37	1434
20	775	38	1472
21	814	39	1511
22	852	40	1550

Procedure for measurement of microwave energy leakage

1. Pour 275±15cc of 20±5°C(68±9°F) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven
2. Start to operate the oven and measure the leakage by using a microwave energy survey meter.
3. Set survey meter with dual ranges to 2,450MHz.
4. When measuring the leakage, always use the 2 inch spacer cone with the probe. Hold the probe perpendicular to the cabinet door. Place the spacer cone of the probe on the door and/or cabinet door seam and move along the seam. The door viewing window and the exhaust openings moving the probe in a clockwise direction at a rate of 1 inch/sec. If the leakage testing of the cabinet door seam is taken near a corner of the door, keep the probe perpendicular to the areas making sure that the probe end at the base of the cone does not get closer than 5 cm to any metal. If if gets closer than 5 cm, erroneous readings may result.
5. Measured leakage must be less than 4mW/cm2 after repair and adjustment.

Maximum allowable leakage is 5mW/cm2. 4mW/cm2 is used to allow for measurement and meter accuracy.

M/W Information		
Specifications	M/W Power	1000 Watts
	M/W Weight	56 Lbs
High Voltage Transformer	Primary low	0.43Ω
	Primary high	0.39Ω
	Secondary	125
	Filament	0.0Ω
Motors	Vent, at run cap (checks all windings)	120Ω
	Turntable Motor	120Ω
	Fan Motor	45Ω

Safety precautions

Some semiconductor (“solid state”) devices are easily damaged by static electricity. Such components are called **Electrostatically Sensitive Devices (ESDs).** Examples include integrated circuits and field-effect transistors. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground.

High Voltage Warning Do not attempt to measure any of the high voltages --this includes the filament voltage of the magnetron. High voltage is present during any cook cycle. Before touching any components or wiring, always unplug the oven and discharge the high voltage capacitor

WARNING: It is critical to route wires and wire harness identical to the way they were, to prevent electromagnetic interference causing possible fault codes.